

## CLAIMS

1 1. A compound of Formula I:



2

3

I

4 wherein

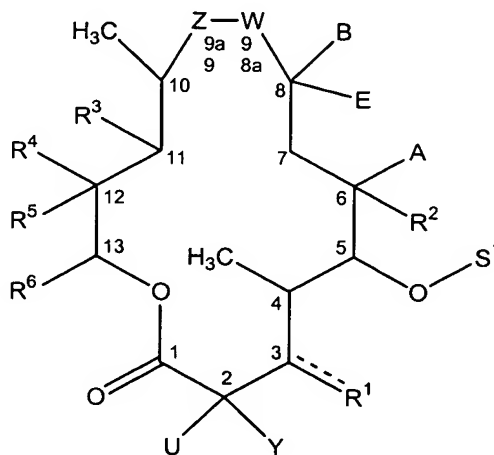
5 M represents a macrolide subunit;

6 D represents a nonsteroidal subunit;

7 L is a linker molecule to which each of M and D are covalently linked; and

8 pharmaceutically acceptable salts and solvates thereof and individual  
9 diastereoisomers thereof.

1 2. A compound according to claim 1 wherein M represents a group of  
2 Formula II:



3

## II

4

5 wherein:

6 Z and W independently are:  $>C=O$ ,  $>CH_2$ ,  $>CH-NR_iR_s$ ,  $>N-R_N$  or  
 7  $>C=N-R_M$  or a bond wherein:

8  $R_i$  and  $R_s$  independently are hydrogen or alkyl;

9  $R_M$  is hydroxy, alkoxy, substituted alkoxy or  $OR^p$ ;

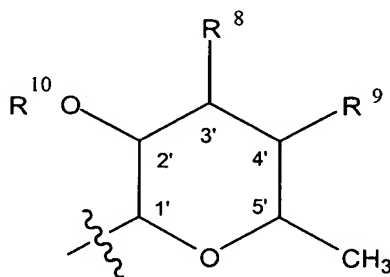
10  $R_N$  is hydrogen,  $R^p$ , alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, or  $-C(X)-$   
 11  $NR_iR_s$ ; wherein X is  $=O$  or  $=S$ ;

12 provided that Z and W cannot both simultaneously be,  $>C=O$ ,  $>CH_2$ ,  
 13  $>CH-NR_iR_s$ ,  $>N-R_N$  or  $>C=N-R_M$  or a bond,

14 U and Y independently are hydrogen, halogen, alkyl, or hydroxyalkyl;

15  $R^1$  is hydroxy,  $OR^p$ ,  $-O-S^2$  group or an  $=O$ ;

16  $S^1$  is a sugar moiety of formula:



17

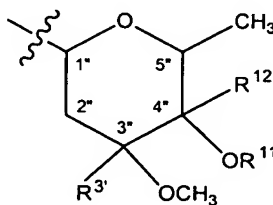
18 wherein

19  $R^8$  and  $R^9$  are both hydrogen or together form a bond, or  $R^9$  is hydrogen  
 20 and  $R^8$  is  $-N(CH_3)R^y$ , wherein

21  $R^y$  is  $R^p$ ,  $R^z$  or  $-C(O)R^z$  wherein  $R^z$  is hydrogen or alkyl or  
 22 alkenyl or alkynyl or cycloalkyl or aryl or heteroaryl or alkyl  
 23 substituted with  $C_2$ - $C_7$ -alkyl,  $C_2$ - $C_7$ -alkenyl,  $C_2$ - $C_7$ -alkynyl, aryl  
 24 or heteroaryl

25  $R^{10}$  is hydrogen or  $R^p$ ;

26  $S^2$  is a sugar moiety of formula :



- 27  
 28 wherein:  
 29  $R^{3'}$  is hydrogen or methyl;  
 30  $R^{11}$  is hydrogen,  $R^p$  or  $O-R^{11}$  is a group that with  $R^{12}$  and with C/4"  
 31 carbon atom forms a  $>C=O$  or epoxy group;  
 32  $R^{12}$  is hydrogen or a group that with  $O-R^{11}$  group and with C/4" carbon  
 33 atom forms a  $>C=O$  or epoxy group;  
 34  $R^2$  is hydrogen, hydroxy,  $OR^p$  or alkoxy  
 35 A is hydrogen or methyl;  
 36 B is methyl or epoxy;  
 37 E is hydrogen or halogen;  
 38  $R^3$  is hydroxy,  $OR^p$ , alkoxy or  $R^3$  is a group that with  $R^5$  and with C/11 and  
 39 C/12 carbon atoms forms a cyclic carbonate or carbamate; or if W or Z is  $>N-R_N$   
 40  $R^3$  is a group that with W or Z forms a cyclic carbamate;  
 41  $R^4$  is  $C_1$ - $C_4$  alkyl;  
 42  $R^5$  is hydrogen, hydroxy,  $OR^p$ ,  $C_1$ - $C_4$ -alkoxy, or a group that with  $R^3$  and  
 43 with C/11 and C/12 carbon atoms forms a cyclic carbonate or carbamate;  
 44  $R^6$  is hydrogen or  $C_1$ - $C_4$ -alkyl;  
 45 wherein **M** has a linkage site through which it is linked to **D** via linking group **L**;  
 46 provided that the linkage site being at one or more of the following:  
 47 a) any reactive hydroxy, nitrogen, or epoxy group located on  $S^1$ ,  $S^2$ , or  
 48 an aglycone oxygen if  $S^1$  or/and  $S^2$  is cleaved off;  
 49 b) a reactive  $>N-R_N$  or  $-NR_iR_s$  or  $=O$  group located on Z or W;  
 50 c) a reactive hydroxy group located at any one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^5$ ;  
 51 d) any other group that can be first derivatized to a hydroxy or  
 52  $-NR_iR_s$  group and  
 53  $R^p$  is hydroxyl or amino protective group.

1 3. A compound according to claim 1 wherein **L** represents a group of  
 2 Formula IV:



## IV

4

5 wherein

6  $X^1$  is selected from:  $-CH_2-$ ,  $-C(O)-$ ,  $OC(O)-$ ,  $N-O-$  or  $-OC(O)NH-$ ,  $-C(O)NH-$ ;7  $X^2$  is  $-NH-$  or  $-NHC(O)-$ ,  $-OC(O)-$ ,  $-C(O)-$ ,  $-O$  or  $-CH_2-$ ;8 Q is  $-NH-$  or  $-CH_2-$ , or absent;

9 wherein each  $-CH_2-$  or  $-NH-$  group may be optionally substituted by  $C_1$ - $C_7$ -alkyl,  
 10  $C_2$ - $C_7$ -alkenyl,  $C_2$ - $C_7$ -alkynyl,  $C(O)R^x$ ,  $C(O)OR^x$ ,  $C(O)NHR^x$  wherein  $R^x$  may be  
 11  $C_1$ - $C_7$ -alkyl, aryl or heteroaryl;

12 the symbols m and n independently are a whole number from 0 to 4, with the  
 13 proviso that if Q is NH, n cannot be 0.

1 4. A compound as claimed in claim 1 wherein D is derived from the NSAIDs  
 2 selecting from: aceclofenac, acemetacin, acetaminophen, acetaminosalol, acetyl-  
 3 salicylic acid, acetyl-salicylic-2-amino-4-picoline-acid, 5-aminoacetylsalicylic acid,  
 4 alclofenac, aminoprofen, amfenac, ampyrone, ampiroxicam, anileridine, bendazac,  
 5 benoxaprofen, bermoprofen,  $\alpha$ -bisabolol, bromfenac, 5-bromosalicylic acid acetate,  
 6 bromosaligenin, bucloxic acid, butibufen, carprofen, celexocib, chromoglycate,  
 7 cinmetacin, clindanac, clopirac, sodium diclofenac, diflunisal, ditazol, droxicam,  
 8 enfenamic acid, etodolac, etofenamate, felbinac, fenbufen, fenclozic acid, fendosal,  
 9 fenoprofen, fentiazac, fepradinol, flufenac, flufenamic acid, flunixin, flunoxaprofen,  
 10 flurbiprofen, glutametacin, glycol salicylate, ibufenac, ibuprofen, ibuproxam,  
 11 indomethacin, indoprofen, isofezolac, isoxepac, isoxicam, ketoprofen, ketorolac,  
 12 lornoxicam, loxoprofen, meclofenamic acid, mefenamic acid, meloxicam,  
 13 mesalamine, metiazinic acid, mofezolac, montelukast, nabumetone, naproxen,  
 14 niflumic acid, nimesulide, olsalazine, oxaceprol, oxaprozin, oxyphenbutazone,  
 15 paracetamol, parsalimide, perisoxal, phenyl-acethyl-salicylate, phenylbutazone,  
 16 phenylsalicylate, pyrazolac, piroxicam, pirprofen, pranoprofen, protizinic acid,  
 17 reserveratol, salacetamide, salicylamide, salicylamide-O-acetyl acid, salicylsulphuric  
 18 acid, salicin, salicylamide, salsalate, sulindac, suprofen, suxibutazone, tamoxifen,  
 19 tenoxicam, tiaprofenic acid, tiaramide, ticlopridine, tinoridine, tolfenamic acid,

20 tolmetin, tropesin, xenbucin, ximoprofen, zaltoprofen, zomepirac, tomoxiprol,  
21 zafirlukast and cyclosporin.

1 5. A compound according to claim 2 wherein Z and W together are: -N(CH<sub>3</sub>)-  
2 CH<sub>2</sub>-, -NH-CH<sub>2</sub>-, -CH<sub>2</sub>-NH-, -C(O)-NH- or -NH-C(O)-;

3 A and B are methyl;

4 E is hydrogen;

5 R<sup>2</sup> is hydroxy or methoxy;

6 S<sup>1</sup> represents desosamine sugar wherein R<sup>8</sup> is selected from: hydrogen, methyl,  
7 amino, C<sub>1</sub>-C<sub>6</sub> alkylamino or C<sub>1</sub>-C<sub>6</sub> dialkylamino;

8 R<sup>9</sup> and R<sup>10</sup> are hydrogen;

9 R<sup>1</sup> is hydroxy or the O-S<sup>2</sup> group wherein the S<sup>2</sup> represents a cladinose sugar  
10 wherein:

11 R<sup>11</sup> is hydrogen, or O-R<sup>11</sup> is a group that with R<sup>12</sup> and with C/4" carbon atom  
12 forms a >C=O or epoxy group; R<sup>12</sup> is hydrogen or a group that with O-R<sup>11</sup>  
13 and with C/4" carbon atom forms a >C=O or epoxy group;

14 R<sup>13</sup> is methyl;

15 U is hydrogen

16 Y is methyl;

17 R<sub>6</sub> is hydroxy, methyl or ethyl;

18 R<sup>5</sup> is hydrogen, hydroxy, methoxy or a group that with R<sup>3</sup> and with C/11 and C/12  
19 carbon atoms forms a cyclic carbonate or carbamate bridge;

20 R<sup>3</sup> is hydroxy or a group that forms a cyclic carbamate bridge with W or Z, or R<sup>3</sup> is  
21 a group that with R<sup>5</sup> and with C/11 and C/12 carbon atoms forms a cyclic carbonate  
22 or carbamate bridge;

23 R<sup>4</sup> is methyl;

24 provided that the linkage is through the nitrogen of Z at N/9a position or through  
25 the carbon of R<sup>12</sup> or through the oxygen of R<sup>11</sup> both at C/4" position of the S<sup>2</sup> sugar.

1 6. A compound according to claim 3 wherein

- 

**1**

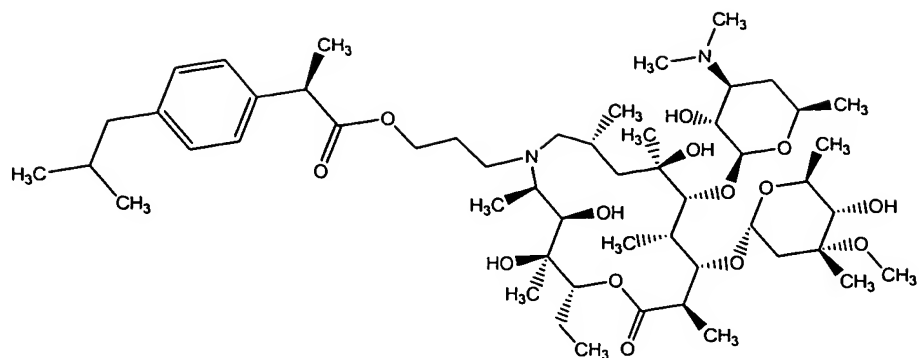
2

1



1

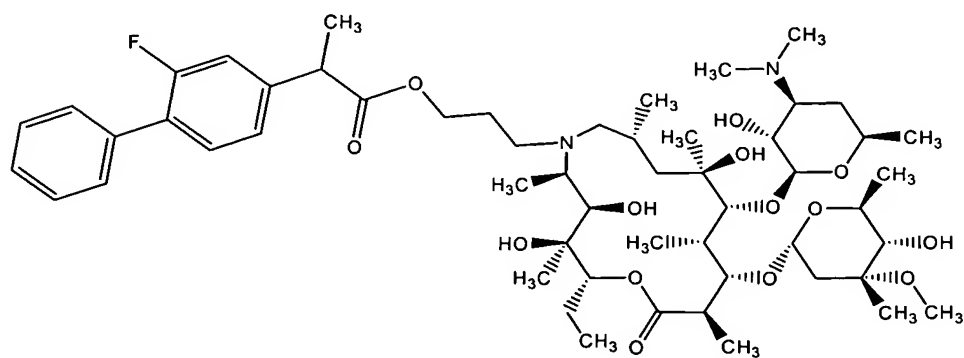
2



3

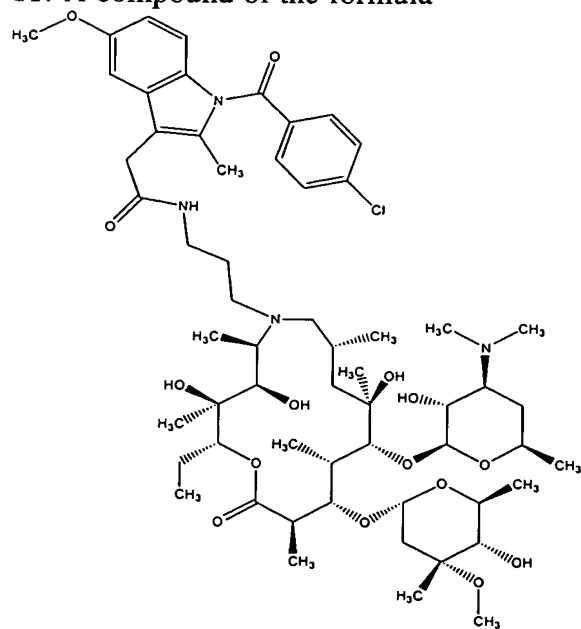
1 10. A compound of the formula

2



3

1 11. A compound of the formula



2

1



**1**



1





1



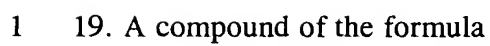
1



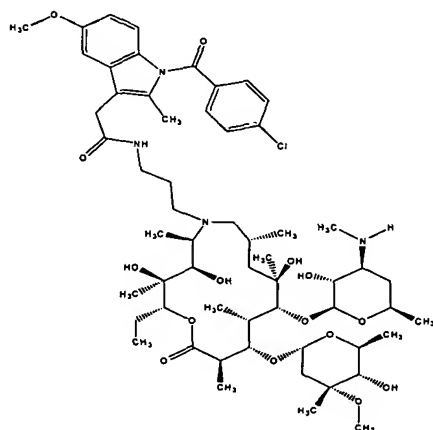
1



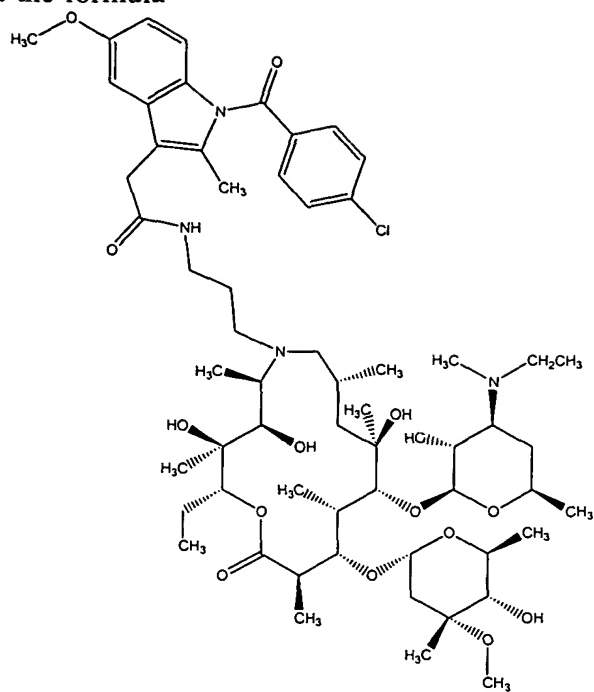
2



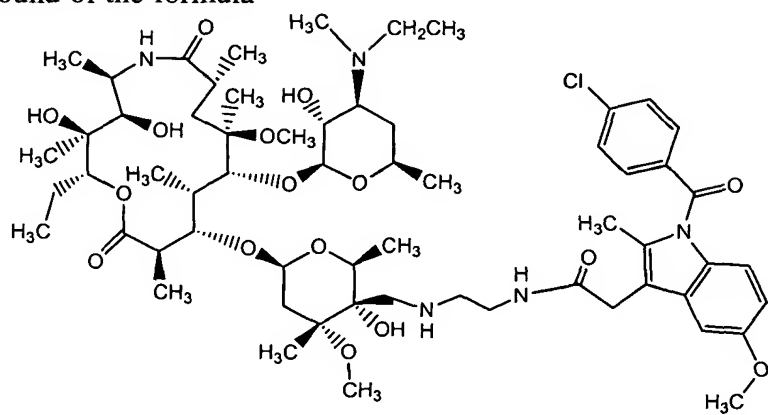
2



2



2



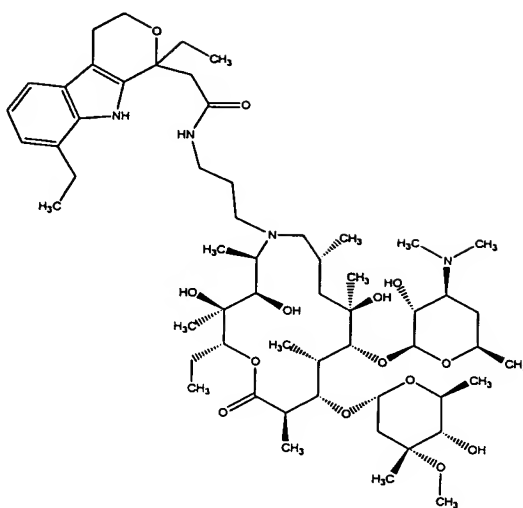
—



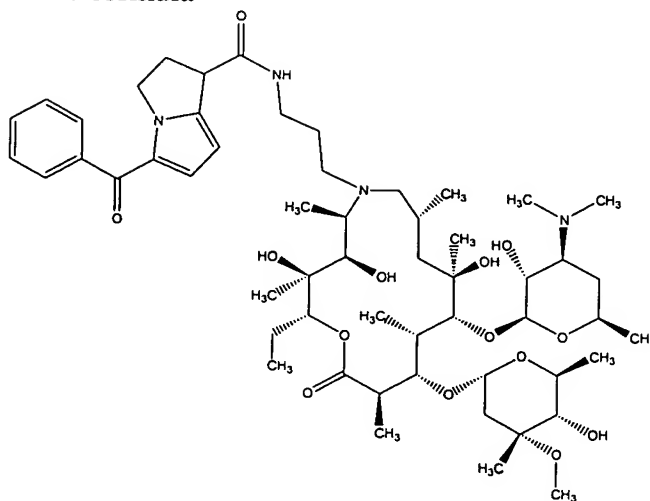
1



- 1 25. A compound of the formula  
2



- 1 26. A compound of the formula  
2



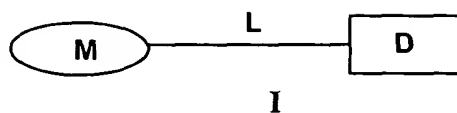
1  
2

**1**



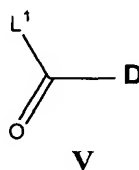


1 31. Process for the preparation a compound of Formula I

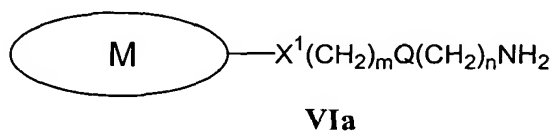


3 which comprises:

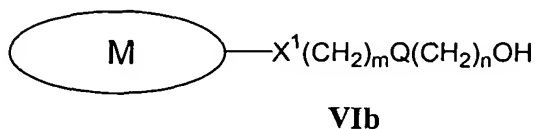
4 a) for a compound of Formula I, where  $X^2$  is  $\text{-NHC(O)-}$ , by reacting a  
5 compound of Formula V:



7 wherein  $\text{L}^1$  represents a leaving group, and a free amino group of a  
8 macrolide represented by Formula VIa:



10 b) for a compound of Formula I, where  $X^2$  is  $\text{-OC(O)-}$ , by reacting a  
11 compound of Formula V and the free hydroxyl group of a macrolide  
12 represented by Formula VIb:







20



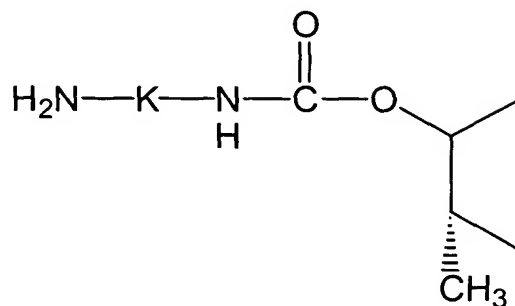
23



and free amino group of of the compound represented by formula:



28 e) for a compound of Formula I, where  $X^1$  is  $-\text{CH}_2-$ , Q is  $-\text{NH}-$  and  $X^2$



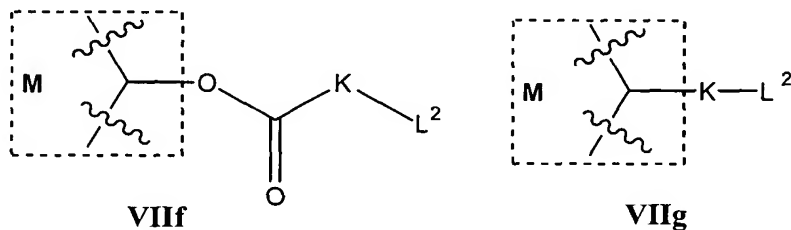
29 is

30  $-\text{NHC(O)}-$ , by reacting a macrolide represented by formula:

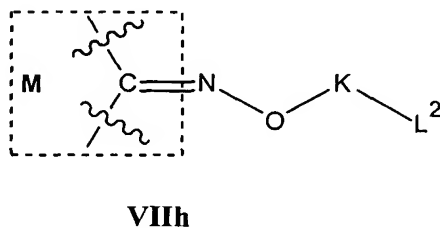
31 and a compound of Formula V;

32 f) for a compound of Formula I by reacting a macrolide represented by

33 Formula **VIIIf** or by Formula **VIIg** or by Formula **VIIIh** having a leaving group  $L^2$



34



35

36 with a free carboxylic acid of nonsteroidal anti-inflammatory subunit.

1 32. A pharmaceutical composition comprising a compound according to claim 1  
2 and pharmaceutically acceptable salts or solvate thereof as well as pharmaceutically  
3 acceptable diluent or carrier.

1 33. A method of treating inflammatory diseases, disorders and conditions  
2 characterized by or associated with an undesirable inflammatory immune response,  
3 and all diseases and conditions induced by or associated with an excessive secretion  
4 of TNF- $\alpha$  and IL-1 which comprises administering to a subject a therapeutically  
5 effective amount of a compound according to claim 1.

1 34. A method of treating inflammatory conditions and immune or anaphylactic  
2 disorders associated with infiltration of leukocytes into inflamed tissue in a subject  
3 in need thereof which comprises administering to said subject a therapeutically  
4 effective amount of the compound represented by Formula I or a pharmaceutically  
5 acceptable salts or solvate thereof.

1 35. The method according to claim 34, wherein inflammatory conditions and  
2 immune disorders are selected from the group consisting of asthma, adult  
3 respiratory distress syndrome, bronchitis, and cystic fibrosis.

1 36. A method according to claim 34, wherein said inflammatory conditions and  
2 immune disorders are selected from the group consisting of inflammatory conditions  
3 or immune disorders of the lungs, joints, eyes, bowel, skin, and heart.

1 37. A method according to claim 34, wherein said inflammatory conditions and  
2 immune disorders are selected from the group consisting of asthma, adult  
3 respiratory distress syndrome, bronchitis, cystic fibrosis, rheumatoid arthritis,  
4 rheumatoid spondylitis, osteoarthritis, gouty arthritis, uveitis, conjunctivitis,

5 inflammatory bowel conditions, Crohn's disease, ulcerative colitis, distal proctitis,  
6 psoriasis, eczema, dermatitis, coronary infarct damage, chronic inflammation,  
7 endotoxin shock, and smooth muscle proliferation disorders.

1 38. A method for abating inflammation in an affected organ or tissue comprising  
2 delivering to said organ or tissue a therapeutically effective amount of the  
3 compound represented by Formula I or a pharmaceutically acceptable salts or  
4 solvate thereof.